REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the reasons that follow. Claims 41, 42, 45, 47, 49, 50, 53, 54, 57, and 58 have been amended, and Claim 46 is canceled. New Claims 79-81 have been added. No new matter has been added by way of these amendments and new claims. Claims 41, 42, 45-50, 53-58, 61-81 will be pending in the present application.

1.   Claim Rejections Under 35 U.S.C. § 103

On page 3 of the Office Action, Claims 41, 42, 45, 49, 50, 53, 57, 58, and 61-78 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2006/0209982 to De Gaudenzi et al. (hereinafter "De Gaudenzi") in view of Dabak et al., "Signal Constellations for Non-Gaussian Communication Problems," Statistical Signal and Array Processing, Minneapolis, April 27-30, 1993, Proceedings of the International Conference on Acoustics, Speech and Signal Processing (ICASSP), New York, IEEE, US, 4:33-36 (hereinafter "Dabak"), further in view of U.S. Patent No. 6,023,493 to Olafsson (hereinafter "Olafsson"). Claims 41, 49, and 57 have been amended to recite features similar to those previously included in Claims 46 and 54, for example. That is, the rejected claims have been amended to indicate that a signal constellation is selected based on an indication of a quantity of antennas. Accordingly, the rejection of Claims 41, 42, 45, 49, 50, 53, 57, 58, and 61-78 is moot.

On page 5 of the Office Action, Claims 46-48 and 54-56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over De Gaudenzi, Dabak, Olafsson, and further in view of U.S. Patent No. 7,269,436 to Won (hereinafter "Won"). Independent Claims 41, 49, and 57 have been amended. Applicants respectfully submit that De Gaudenzi, Dabak, Olafsson, and Won, alone or in combination, fail to disclose, teach, or suggest each and every element of Claims 41, 49, and 57, as amended.

A.   Claims 41, 49, and 57

Amended independent Claim 41 recites, in part (with emphasis added):

> selecting a signal constellation from a plurality of stored signal
> constellations, the selected signal constellation including a

plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points;

…

wherein said selecting a signal constellation from a plurality of stored signal constellations is based on an indication of a number of transmit antennas used in transmitting the modulated carrier wave.

Independent Claims 49 and 57 recite similar elements. Applicants respectfully submit that De Gaudenzi, Dabak, Olafsson, and Won, alone or in combination, fail to disclose, teach, or suggest such elements.

De Gaudenzi is directed to a "new class of 16-ary Amplitude and Phase Shift Keying (APSK) coded modulations." (Abstract). As such, De Gaudenzi teaches a new modulation scheme for use with different coding schemes. However, De Gaudenzi fails to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations … based on an indication of a number of transmit antennas," as recited in Claim 41.

Dabak fails to cure the deficiencies of De Gaudenzi. Dabak is directed to a procedure for determining or constructing optimum signal sets. (Abstract). Dabak describes a procedure in which optimum signal constellations are designed using logarithmic error probability rates that are determined based on Kullback information. However, Dabak fails to disclose the selection of a signal constellation. Accordingly, Dabak also fails to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations … based on an indication of a number of transmit antennas," as recited in Claim 41.

Olafsson fails to cure the deficiencies of De Gaudenzi and Dabak. Olafsson is directed to a "pulse code modulation modem system [that] is configured to transmit data from a first modem to a second modem over the public switched telephone network." (Abstract). Column 10, lines 14-18 of Olafsson states that "optimized signal point constellations [are derived] by analyzing the RBS information obtained in connection with the diagnostic signal" and that these constellations are selected "from a group of predetermined constellations."

However, Olafsson fails to indicate that the constellations are selected "based on an indication of a number of transmit antennas." In fact, Olafsson does not discuss or even mention the use of "transmit antennas." Accordingly, Olafsson fails to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations ... based on an indication of a number of transmit antennas," as recited in Claim 41.

Applicants respectfully submit that Won also fails to disclose such an element. On page 6 of the Office Action, the Examiner stated:

> *Won* discloses the transmitter can estimate the channel covariance matrix using a preamble transmitted from the receiver. The transmitter can also update the number of antennas and the power allocation according to the eigenvalues of the estimated covariance matrix (column 7, lines 42-48). ... Won discloses transmitting information from the antennas. The signal constellation of the combination is selected based on the modulated transmitted signal. Therefore, the selecting of the signal constellation is based (dependent on) a number of transmit antennas used to transmit the signal.

Column 7, lines 42-48 of Won states:

> For example, the transmitter can estimate the channel covariance matrix (e.g., the change of the channel for each burst unit (normally, size of 100 symbols)) using a preamble or midamble transmitted from the receiver. The transmitter can also update the number of antennas and the power allocation according to the eigenvalues of the estimated covariance matrix and the size of the eigenvalues.

As such, Won discloses only that the transmitter can update the number of antennas and the power allocation using the eigenvalues of the estimated covariance matrix. Won fails to disclose anything relating to "selecting a signal constellation ... based on an indication of the number of the transmit antennas."

The Examiner appears to further assert that the combination of De Gaudenzi, Dabak, and Olafsson disclose selecting a signal constellation based on a transmitted signal and that because a signal is transmitted by an antenna, the selection is "based (dependent on)" a number of transmit antennas. However, Applicants respectfully submit that merely because a

signal is transmitted by transmit antennas does not mean that the selection of a constellation is "based on an indication of the number of the transmit antennas," as recited in Claim 41. No where do De Gaudenzi, Dabak, Olafsson, or Won, alone or in combination, disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations ... based on an indication of a number of transmit antennas," as recited in Claim 41.

As a result, Applicants respectfully submit that De Gaudenzi, Dabak, Olafsson, and Won fail to disclose, teach, or suggest at least one element of each of independent Claims 41, 49, and 57 and their associated dependent claims. A rejection under 35 U.S.C. § 103(a) cannot be properly maintained where the applied references fail to teach each and every element of the rejected claims. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of Claims 41, 42, 45-50, 53-58, and 61-78 under 35 U.S.C. § 103(a).

B. Claims 76-78

Claims 76-78 recite, in part, that "the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm." In the Office Action, the Examiner failed to directly address these claims. Applicants respectfully submit that De Gaudenzi, Dabak, Olafsson, and Won, alone or in combination, fail to disclose, teach, or suggest that "the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm," as recited in Claims 76-78.

On page 2 of the Office Action, the Examiner acknowledged that De Gaudenzi does not expressly disclose storing ... constellations." In addition, the Examiner did not assert that Dabak or Won disclose storing of signal constellations, and indeed they do not. Instead, the Examiner asserted that Olafsson discloses that "a signal constellation is selected form a group of predetermined constellations." However, Olafsson fails to disclose, teach, or suggest that the "plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm," as recited in Claims 76-78. In fact, Olafsson fails to even mention a "look-up table" or an "algorithm."

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of Claims 76-78 under 35 U.S.C. § 103(a).

II.   New Claims 76-78

New Claims 79-81 have been added. New Claims 79-81 recite elements previously included in Claims 41, 49, and 57. As discussed above, De Gaudenzi, Dabak, Olafsson, and Won, alone or in combination, fail to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations … based on an indication of a number of transmit antennas," as recited in Claim 41. Claims 49 and 57 recite similar elements. New Claims 79-81 depend from Claims 41, 49, and 57, respectively. Accordingly, Applicants respectfully request favorable consideration of newly added Claims 79-81.

Applicants believe that the present application is in condition for allowance. Favorable reconsideration of the application is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extension of time is needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date___February 15, 2010___   By _____

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